Sudden death in young athletes

There have been a number of recent tragic stories about high school and college-aged ostensibly healthy youths dying unexpectedly after competing in physical activities. Many may wonder why this happens, and whether it is preventable.

Common childhood illnesses such as severe asthma may be exacerbated by strenuous exercise or cold weather. When recognized, appropriate precautions can be taken to minimize risk of recurrence. Occasionally, asthmatic attacks may be so severe that emergency room visits and hospitalizations may be required due to compromised oxygenation and possibly resultant irregular heart beats. Blunt trauma to the chest may cause cardiac bruising or rarely rupture of structures like blood vessels with sudden death the result.

However, most of the fatal episodes reported in young amateur athletes are caused by a fatal heart rhythm. It’s general knowledge that the heart is a mechanical organ that pumps blood to the organs, but we also know that the heart has a complex electrical system that controls the electrical signal that makes the heart beat efficiently and appropriately.

There are cardiac conditions that may be completely unrecognized in routine circumstances but that, under the physical stress of athletics, be unmasked with serious results.

I will list several of the most common responsible conditions. These conditions have variations in seriousness so that only formal evaluation by the appropriate specialists can determine the best recommendations.

Cardiologists are interested in identifying youths with hypertrophic cardiomyopathies, a heritable condition with abnormal muscle structure and inappropriate regional enlargement of the main pumping chambers. Another condition is called arrhythmogenic right ventricular dysplasia, a structural malformation of a heart chamber that can produce spontaneous and effort related fatal irregular heart beats. This condition afflicted some well-known young actors and fashion models who died suddenly. Routine electrocardiograms may reveal a genetic condition called Long QT Syndrome that, if severe or worsened by certain medications, can also predispose to fatal irregular heartbeats even without physical stress.

The coronary arteries that feed the heart muscle with oxygenated blood may sometime arise from the wrong place, or take a course through the heart that compromises the amount of blood carried, with the end result being inadequate heart muscle oxygenation under the stress of athletics which potentially leads to a heart rhythm disorder.

There are congenital conditions like Marfan’s Syndrome or severe variations of common entities like mitral valve prolapse that may have serious implications for athletic activities. The vast majority of these patients live normal lives, but severe cases may place them at increased risk under certain circumstances.

That’s a partial list of the major common causes. What is more important is to know how doctors may sort out whether a youthful athlete may be at risk.

A history of effort related symptoms such as marked shortness of breath, dizziness or palpitations might be cause for investigation. An unexplained heart murmur or certain characteristics on physical examination may also prompt one to seek medical evaluation. The doctor can then choose from simple screening tests such as an electrocardiogram, a sophisticated non-invasive imaging test like an echocardiogram or a physiologic stress test to provoke possible abnormalities. The doctor may choose extended duration heart rhythm monitors such as a daylong Holter or a multi-week event monitor to remotely detect irregular heart rhythms. If indicated, a consultation with a cardiologist who specializes in the heart’s electrical system may be in order. Depending on the uncovered condition, interventions with lifestyle changes, medications, surgical or electrical procedures may be able to save lives, even though it may mean an end to a competitive athletic career.

Sudden and unexpected death in young healthy person is an enormous human tragedy. But a vigilant and high index of suspicion may trigger investigations that may result in preventable events.

Irving Kent Loh MD FACC FAHA FCCP FACP is medical director of the Ventura Heart Institute (www.venturaheart.com) in Thousand Oaks, CA. His email is drloh@venturaheart.com.